Bahan Ajar

Chapter 3

Materi Pembelajaran

Matakuliah :

Sensor dan Aktuator

Kode Matakuliah : SKO20419

Prodi : SISTEM KOMPUTER

Dosen Pengampu Matakuliah:

Dodi Yudo Setyawan, S.Si., M.T.I

Menghitung karakteristik dinamik sensor dan aktuator

What is a Strain Gauge?

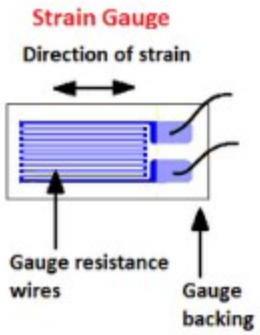


Figure #1

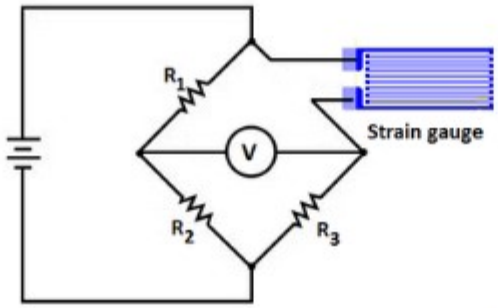
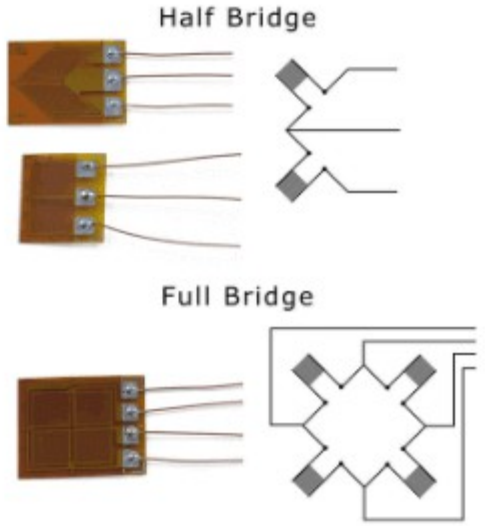
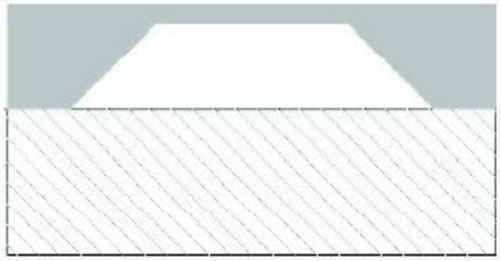


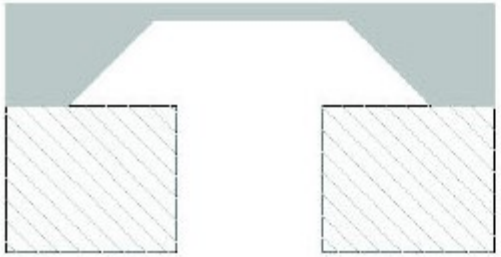
Figure #2



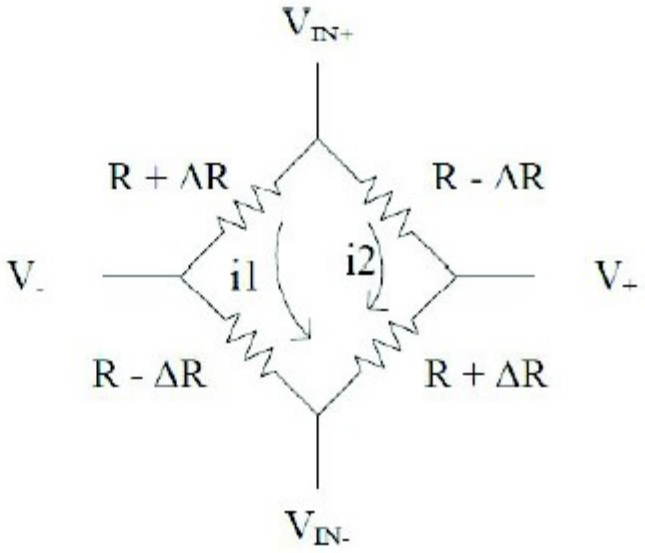
Electrical 4 U



1. Absolute Mode



2. Gauge Mode



3. Bridge Resistor Structure

Figure 1

When pressure presses on the sensor, the output voltage signal is positive value.

$$\text{Count} = (V_+ - V_-) / (V_{IN+} - V_{IN-}) = \Delta R / R$$

$$= \text{Span} \times (1 + TCS \times \Delta T) \times P / FS + \text{Offset} + \text{Span} \times TCO \times \Delta T$$

$$P \fallingdotseq \text{Gain} \times (1 - TCS \times \Delta T) \times (\text{Count} - \text{Offset}) - TCO \times FS \times \Delta T$$

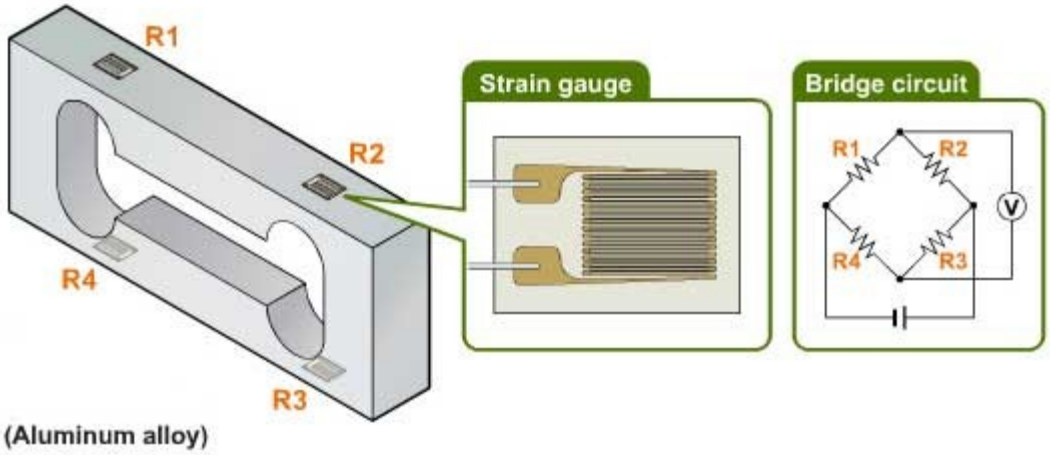
Among it,

$\Delta T = T - T_c$: Temperature differences of now and the time when calibration was implemented.

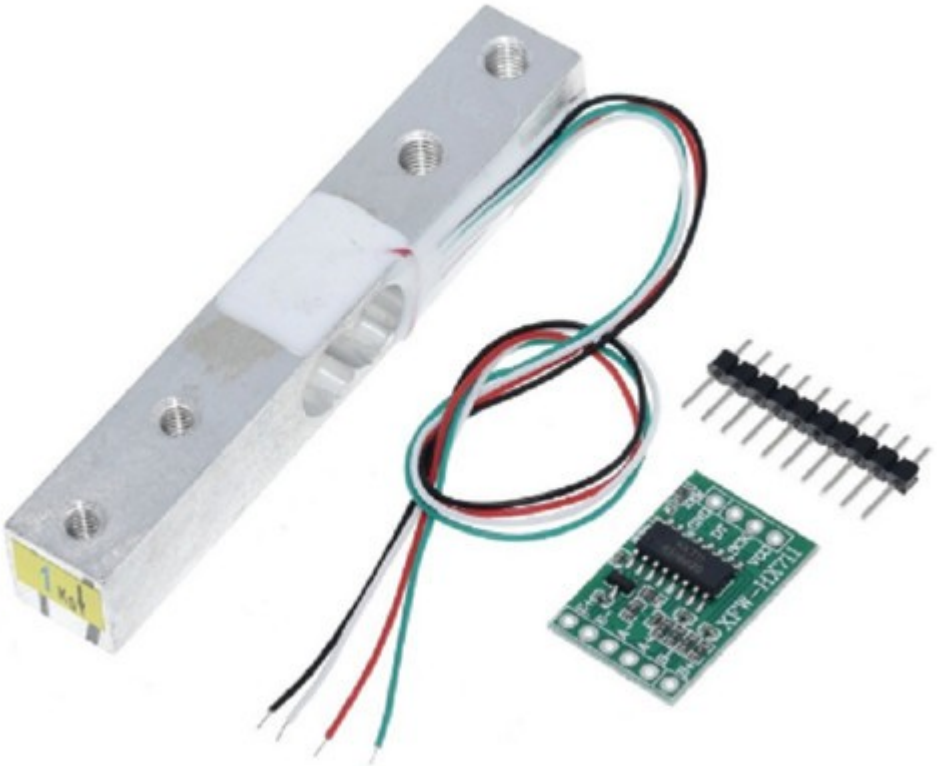
TCS is the temperature coefficient of span (Unit: %/℃)

TCO is the temperature coefficient of offset (Unit: %/℃)

Gain = FS / Span (Unit: mBar/Count)


R1
R2
R4
R3
(Aluminum alloy)
Strain gauge
Bridge circuit
R1
R2
R4
R3
V

digpart



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